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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/582,064	06/08/2006	Timo Kolhmainen	KOL.216.WUS	1549
76385	7590	03/16/2009	EXAMINER	
Hollingsworth & Funk, LLC 8009 34th Avenue South Suite 125 Minneapolis, MN 54425			PRABHAKHER, PRITHAM DAVID	
			ART UNIT	PAPER NUMBER
			2622	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/582,064	Applicant(s) KOLEHMAINEN ET AL.	
	Examiner PRITHAM PRABHAKHER	Art Unit 2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 June 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-42 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-42 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 June 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>03/16/2007</u> . | 6) <input type="checkbox"/> Other: _____ |

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APPLICATION NO./ CONTROL NO.	FILING DATE	FIRST NAMED INVENTOR / PATENT IN REEXAMINATION	ATTORNEY DOCKET NO.
10582064	6/8/2006	KOLEHMAINEN ET AL.	KOL.216.WUS

Hollingsworth & Funk, LLC
8009 34th Avenue South
Suite 125
Minneapolis, MN 54425

EXAMINER

PRITHAM PRABHAKHER

ART UNIT	PAPER
2622	20090309

DATE MAILED:

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner for Patents

DETAILED ACTION

Drawings

The subject matter of this application admits of illustration by a drawing to facilitate understanding of the invention. Applicant is required to furnish separate sheets of drawings under 37 CFR 1.81(c). No new matter may be introduced in the required drawing. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d).

Specification

This application does not contain an abstract of the disclosure as required by 37 CFR 1.72(b). An abstract on a separate sheet is required.

Double Patenting

Claim 20 is objected to under 37 CFR 1.75 as being a substantial duplicate of claim 7. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 39-42 are rejected under 35 U.S.C. 102(b) as being anticipated by Yu et al. (US Patent No.: 6611289B1).

*Regarding **Claim 39**, Yu et al. disclose an imaging device comprising at least two image capturing apparatus, each apparatus being arranged to produce an image, where in at least one image capturing apparatus is used for measuring exposure parameters (**Figure 3 and Column 5, Line 15 to Column 6, Line 43**).*

*With regard to **Claim 40**, Yu et al. disclose the imaging device of claim 39, comprising at least four image capturing apparatus, wherein three image capturing apparatus each comprise an unique colour filter from a group of filters red, green or blue (**Figure 3 and Column 5, Line 15 to Column 6, Line 43**).*

*In regard to **Claim 41**, Yu et al. disclose an imaging device comprising at least two image capturing apparatus and a sensor array configured to produce an electric signal when exposed to light, the sensor array being divided between at least two image capturing apparatus (**Figure 3 and Column 5, Line 15 to Column 6, Line 43**).*

*Regarding **Claim 42**, Yu et al. disclose a method of creating an image file in an imaging device, comprising producing images with at least two image capturing*

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apparatus and using at least one image capturing apparatus for measuring exposure parameters (Figure 3 and Column 5, Line 15 to Column 6, Line 43; Column 9, Lines 41-46).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-6, 8-14, 19, 22-30, 33, 36 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yu et al. (US Patent No.: 6611289B1) and further in view of Weldy (EP 0858208A1)

*In regard to **Claim 1**, Yu et al. disclose an imaging device (**Figure 3**) comprising at least two image capturing apparatus (**Figure 3**), each apparatus being arranged to produce an image comprising pixels, the apparatus being configured to utilize at least a portion of the images produced with different image capturing apparatus with each other (Each individual sensor is independently exposed to a subject, **Column 5, Lines 65-67; Column 6, Lines 37-43 and Lines 61-65**) to produce an image with an enhanced image quality (The final image produced has an enhanced image quality (Increased dynamic range), **Figure 8**), wherein at least one image capturing apparatus has a*

*different light gathering capability and the image produced by the at least one apparatus is used for enhancing the dynamic range of the image produced with the other image capturing apparatus (The dynamic range is increased because one of the image capturing devices is equipped to have a different light gathering capability. One of the image sensors is a B/W sensor. The remaining three sensors detect one primary color each of Red, Green and Blue, **Column 9, Lines 4-27**). Yu et al. also disclose doing this by combining at least a portion of the images (**Column 7, Lines 47-53**).*

*However, Yu et al. do not disclose combining at least a portion of the images by using an averaging method for each pixel to be combined. Weldy disclose an image capturing apparatus that combines images acquired with image capturing devices having different light gathering capabilities (different depth of field), **Pages 5, Lines 33-41 of Weldy**. Weldy disclose combining the images using an averaging method on a pixel by pixel basis, **Page 4, Lines 55-58 of Weldy**. It would have been obvious and well-known to one of ordinary skill in the art at the time of the invention to incorporate into the teachings of Yu et al., the method of combining images using an averaging method as disclosed by Weldy, because this is a standard and well-known way of reducing the effects of deviant pixels in the final enhanced image.*

*With regard to **Claim 2**, Yu et al. and Weldy disclose the device of claim 1, comprising an image capturing apparatus configured to analyze the images produced with the image capturing apparatus and to determine which portions of an image to utilize (**Claim 5 of Yu et al.**).*

*In regard to **Claim 3**, Yu et al. and Weldy disclose the device of claim 1, comprising an image capturing apparatus configured to combine at least a portion of the images produced with different image capturing apparatus with each other (**Claim 5 of Yu et al.**).*

*With regard to **Claim 4**, Yu et al. and Weldy disclose the device of claim 1, wherein at least one image capturing apparatus has a small aperture. Weldy disclose capturing different images at different depths of field. To do this, Weldy disclose having different aperture sizes for each of the image capturing devices, **Page 5, Lines 33-41 of Weldy**. Therefore, as a result, one of the image-capturing apparatus' will have a smaller aperture in comparison to the other. It would have been obvious and well-known to one of ordinary skill in the art at the time of the invention to incorporate different apertures to obtain differences in depth of field, because this can improve the signal-to-noise ratio and performance of the system, **Page 5, Lines 33-41 of Weldy**.*

*In regard to **Claim 5**, Yu et al. and Weldy disclose the device of claim 1, wherein at least one image capturing apparatus has higher aperture than other apparatus. Weldy disclose capturing different images at different depths of field. To do this, Weldy disclose having different aperture sizes for each of the image capturing devices, **Page 5, Lines 33-41 of Weldy**. Therefore, as a result, one of the image-capturing apparatus' will have a higher aperture in comparison to the other. It would have been obvious and*

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*well-known to one of ordinary skill in the art at the time of the invention to incorporate different apertures to obtain differences in depth of field, because this can improve the signal-to-noise ratio and performance of the system, **Page 5, Lines 33-41 of Weldy.***

*With regard to **Claim 6**, Yu et al. and Weldy do not explicitly disclose the device of claim 1, comprising an image capturing apparatus configured to utilize a weighted mean method for each pixel to be combined. Official notice is taken by the examiner on utilizing a weighted mean method for combining pixels. It would have been obvious and well-known to one of ordinary skill in the art at the time of the invention to incorporate a weighted-mean method for combining pixels into the teachings disclosed by Yu et al. and Weldy, because this helps in detecting and excluding deviant pixels from the final enhanced image.*

*In regard to **Claim 8**, Yu et al. and Weldy disclose the device of claim 1, wherein the image capturing apparatus comprise a lens system and a sensor array configured to produce electric signal and the device comprises a processor operationally connected to the sensor arrays and configured to produce an image proportional to the electrical signal received from the sensor arrays (**Figure 3 and Column 1, Lines 23-32 of Yu et al.**).*

*Regarding **Claim 9**, Yu et al. and Weldy disclose the device of claim 8, comprising a sensor array divided between at least two image capturing apparatus (**Figure 3 of Yu et al.**).*

*With regard to **Claim 10**, Yu et al. and Weldy disclose the device of claim 1, comprising a lenslet array with at least four lenses (**Figures 3 and 4A of Yu et al.**).*

*With regard to **Claim 11**, Yu et al. and Weldy disclose the device of claim 8, comprising a sensor array and four image capturing apparatus, each apparatus using one lens from the lenslet array and a portion of the sensor array (**Figures 3, 4A-4B; Column 5, Line 65 to Column 6, Line 43 of Yu et al.**).*

*In regard to **Claim 12**, Yu et al. and Weldy disclose the device of claim 9, wherein three image capturing apparatus are configured to produce a colour image (R,G and B from Figure 3 of Yu et al.); that the fourth image capturing apparatus is configured to produce an image (324 in Figure 3 of Yu et al.); and the device comprises a processor configured to combine at least a portion of the images with each other to produce an image with an enhanced image quality (The four images are combined, **Column 6, Line 1 to Column 7, Line 59 of Yu et al.**).*

With regard to **Claim 13**, Yu et al. and Weldy disclose the device of claim 10, wherein the three image capturing apparatus each comprise an unique colour filter from a group of filters red, green or blue (**Figure 3 and Column 5, Lines 14-27 of Yu et al.**).

In regard to **Claim 14**, Yu et al. and Weldy do not explicitly disclose the device of claim 10, wherein each of the three image capturing apparatus comprises a unique colour filter from a group of filters cyan, magenta or yellow (**Page 6, Lines 13-17 of Weldy**). It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate a unique filter from a group of filters cyan, magenta or yellow, because they are part of well-known color space describing the way colors can be represented in an image to make it more appealing to the viewer of the image.

Regarding **Claim 19**, Yu et al. and Weldy disclose the device of claim 1, comprising at least one image capturing apparatus configured to measure exposure parameters (**Column 6, Lines 37-43 of Yu et al.**).

With regard to **Claim 22**, Yu et al. and Weldy disclose the device of claim 1, wherein each image capturing apparatus comprises a different aperture and is dedicated to a different spectral band. Weldy disclose capturing different images at different depths of field. To do this, Weldy disclose having different aperture sizes for each of the image capturing devices, **Page 5, Lines 33-41 of Weldy**. Therefore, as a result, one of the image-capturing apparatus' will have a smaller aperture in comparison

*to the other. It would have been obvious and well-known to one of ordinary skill in the art at the time of the invention to incorporate different apertures to obtain differences in depth of field, because this can improve the signal-to-noise ratio and performance of the system, **Page 5, Lines 33-41 of Weldy.***

*Regarding **Claim 23**, Yu et al. and Weldy disclose the device of claim 1, wherein each image capturing apparatus comprises a lens arrangement (**Figure 3 of Yu et al.**).*

*In regard to **Claim 24**, Yu et al. and Weldy disclose the device of claim 1, wherein at least one image capturing apparatus is configured to use a different exposure time compared to other apparatus (**Column 9, Lines 43 to 46 of Yu et al.**).*

*Regarding method **Claims 25-30, 33, 36 and 38** correspond to apparatus claims 1-3, 6, 8, 11-12, 19 and 23 and are rejected as discussed above with respect to those claims.*

Claims 7, 17, 20-21, 34 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yu et al. (US Patent No.: 6611289B1) and Weldy (EP 0858208A1) as applied to claims 1 and 25 above, and further in view of Watanabe et al. (US Pub No.: 20030103157A1)

*In regard to **Claim 7**, Yu et al. and Weldy do not explicitly disclose the device of claim 1, wherein at least one image capturing apparatus comprises a polarization filter. Watanabe et al. disclose an image capturing apparatus that that has a polarization filter (**Paragraph 0376 of Watanabe et al.**). It would have been obvious and well-known to one of ordinary skill in the art at the time of the invention to incorporate a polarization filter in for one of the filters disclosed by Yu et al. and Weldy, because a polarizing filter can be used to darken overly light sections of an image caused by reflections therefore increasing contrast within sections of an image.*

*With regard to **Claim 17**, Yu et al. and Weldy do not explicitly disclose the device of claim 1, comprising at least one image capturing apparatus shielded for producing a dark reference. Watanabe et al. disclose an image capturing apparatus that has a polarization filter (**Paragraph 0376 of Watanabe et al.**). It would have been obvious and well-known to one of ordinary skill in the art at the time of the invention to incorporate a polarization filter in for one of the filters disclosed by Yu et al. and Weldy to darken an overly light section of an image, because this increases the contrast within sections of the image.*

*With regard to **Claim 20**, Yu et al. and Weldy do not explicitly disclose the device of claim 1, comprising at least one image capturing apparatus comprising a polarization filter. Watanabe et al. disclose an image capturing apparatus that has a polarization*

*filter (**Paragraph 0376 of Watanabe et al.**). It would have been obvious and well-known to one of ordinary skill in the art at the time of the invention to incorporate a polarization filter in for one of the filters disclosed by Yu et al. and Weldy, because a polarizing filter can be used to darken overly light sections of an image caused by reflections therefore increasing contrast within sections of an image.*

*Regarding **Claim 21**, Yu et al. and Weldy do not explicitly disclose the device of claim 1, comprising at least one image capturing apparatus configured to produce images from which a specific light polarization direction has been removed. Watanabe et al. disclose an image capturing apparatus that has a polarization filter (**Paragraph 0376 of Watanabe et al.**). It would have been obvious and well-known to one of ordinary skill in the art at the time of the invention to incorporate a polarization filter in for one of the filters disclosed by Yu et al. and Weldy, because a polarizing filter can be used to darken overly light sections of an image caused by reflections therefore increasing contrast within sections of an image.*

*Watanabe et al. also disclose producing images from which a specific light polarization direction has been removed (**Paragraph 0376 of Watanabe et al.**). It would have been obvious and well-known to one of ordinary skill in the art at the time of the invention to remove polarization from a specific light direction, since not every section of the image will require darkening and this will help lend to a better image.*

*With regard to method **Claim 34**, this claim corresponds to apparatus claim 17 and is rejected as discussed above with respect to apparatus claim 17.*

*With regard to method **Claim 37**, this claim corresponds to apparatus claim 21 and is rejected as discussed above with respect to apparatus claim 21.*

Claims 15 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yu et al. (US Patent No.: 6611289B1) and Weldy (EP 0858208A1) as applied to claims 1, 9-12, 25 and 29-30 above, and further in view of Sato (US Patent No.: 7256827B1)

*With regard to **Claim 15**, Yu et al. and Weldy do not disclose the device of claim 12, wherein the fourth image capturing apparatus comprises a Bayer matrix. Sato disclose an image capturing device that includes a Bayer matrix (**Abstract, Figure 3 and Claim 13 of Sato**). It would have been obvious and well-known to one of ordinary skill in the art at the time of the invention to incorporate a Bayer matrix into the fourth image capturing apparatus disclosed by Yu et al. and Weldy, because it enables the image capturing apparatus to receive a proportionate quantity of information regarding*

basic color efficiently because the relative sampling rates by color are in effect adjusted respective of the characteristics of human visual response.

*Regarding method **Claim 31**, this corresponds to apparatus claim 15 and is rejected as discussed above with respect to apparatus claim 15.*

Claims 16 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yu et al. (US Patent No.: 6611289B1) and Weldy (EP 0858208A1) as applied to claims 1, 9-12, 25 and 29-30 above, and further in view of Olsen et al. (US Patent No.: 7199348B2).

*In regard to **Claim 16**, Yu et al. and Weldy do not explicitly disclose the device of claim 12, wherein the fourth image capturing apparatus produces infra-red images. Olsen et al. disclose an image capturing device with four image capturing apparatus', wherein the fourth image capturing apparatus produces infra-red images (**Figures 3A and 5A of Olsen et al.**). It would have been obvious and well-known to one of ordinary skill in the art at the time of the invention to enable the fourth image capturing apparatus disclosed by Yu et al. and Weldy, to output an IR image, because it can be used along with the colors to give low-light capabilities to the sensor and therefore increase the range of the visible spectrum to produce a high quality image.*

*With regard to method **Claim 32**, this claim corresponds to apparatus claim 16 and is rejected as discussed above with respect to apparatus claim 16.*

Claims 18 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yu et al. (US Patent No.: 6611289B1) and Weldy (EP 0858208A1) as applied to claims 1 and 25 above, and further in view of Suda (US Patent No.: 7262799B2)

*In regard to **Claim 18**, Yu et al. and Weldy do not explicitly disclose the device of claim 1, comprising at least one image capturing apparatus is configured to measure white balance. Suda discloses an image sensing apparatus with a plurality of apertures (**Abstract of Suda**) that has a white balance circuit in the RGB image processing circuit for performing white balance, **Column 15, Lines 56 et seq. of Suda**. It would have been obvious and well-known to one of ordinary skill in the art at the time of the invention to enable the device disclosed by Yu et al. and Weldy to measure white balance, because it helps in adjusting neutral colors correctly in the final image.*

*With regard to method **Claim 35**, this claim corresponds to apparatus claim 18 and is rejected as discussed above with respect to apparatus claim 18.*

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PRITHAM PRABHAKHER whose telephone number is (571)270-1128. The examiner can normally be reached on M-F (7:30-5:00) Alt Friday's Off.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Ometz can be reached on (571)272-7593. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David L. Ometz/
Supervisory Patent Examiner, Art
Unit 2622

Pritham David Prabhakher
Patent Examiner
Pritham.Prabhakher@uspto.gov
/Pritham Prabhakher/
Examiner, Art Unit 2622